

Europäisches Patentamt
European Patent Office
Office européen des brevets

EP 0 884 626 A2

EUROPEAN PATENT APPLICATION

(51) Int. Cl. G02F 1/139, G02F 1/1337

- (12) Date of publication: 16.12.1998 Bulletin 1998/51
(21) Application number: 98304640.1
(22) Date of filing: 11.06.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LU
NL PT SE
Designated Extension States:
AL LT LV MK RO SI

- (30) Priority: 12.06.1997 JP 155437/97
27.06.1997 JP 230982/97
27.06.1997 JP 230981/97
30.09.1997 JP 256357/97
26.12.1997 JP 381394/97

(71) Applicant: FUJITSU LIMITED
Kawasaki-shi, Kanagawa 211-8588 (JP)

- (72) Inventors:
• Takada, Akihito,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Morikubo, Masato,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Ohtsuro, Kazumasa,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Furukawa, Noriaki,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Koda, Yoshio,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Kamada, Tetsuroshi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Katsuka, Shingo,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tanaka, Yoshinori,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Sasaki, Takahiro,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Hosono, Akiyuki,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)

- Sasaki, Takahiro,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Hayashi, Shirogo,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tada, Hirotaki,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Takazawa, Hideaki,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Chida, Hideo,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Kojima, Takeshi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Ohuchi, Makoto,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tachibana, Masato,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Ohtsuro, Kazuo,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Inoko, Keiji,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Yamaguchi, Masashi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Hasegawa, Tadashi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Ohtani, Minoru,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Yoshida, Hirotomi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Inoue, Kinyaesu,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Ikeda, Masahiro,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)

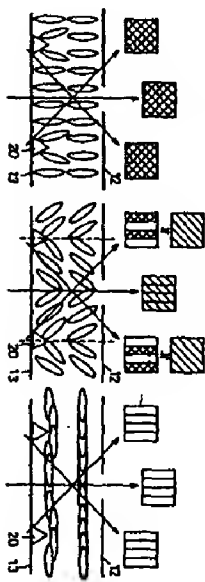
- Teraguchi, Yoji,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tashiro, Kunihiko,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Fujikawa, Tetsuya,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tanaka, Yasuhiro,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Murata, Satoshi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Hayama, Takatoshi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Sawasaka, Mamoru,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)

- Tanuma, Seiji,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Hirata, Shiro,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Nakamura, Toshi,
c/o Fujitsu Limited
Kawasaki-shi, Kanagawa 211-8588 (JP)
• Tanaka, Tomonori,
c/o Yonago Fujitsu Limited
Yonago-shi, Tokushima 680-3524 (JP)
• Tsubota, Kouji,
c/o Yonago Fujitsu Limited
Yonago-shi, Tokushima 680-3524 (JP)
• Furukawa, Akiyuki,
c/o Yonago Fujitsu Limited
Yonago-shi, Tokushima 680-3524 (JP)
• Furukawa, Akiyuki,
c/o Yonago Fujitsu Limited
Yonago-shi, Tokushima 680-3524 (JP)

(74) Representative:
Fenton, Christine Lesley et al
Hesselline Lake & Co.,
Imperial House,
15-19 Kingsway
London WC2B 6UD (GB)

- (54) Vertically-aligned (VA) liquid crystal display device
(57) A vertically aligned mode liquid crystal display device having an improved viewing angle characteristic is disclosed. The disclosed liquid crystal display device uses a liquid crystal having a negative anisotropic dielectric constant, and orientations of the liquid crystal are vertical to substrates (12,13) when no voltage is applied, almost horizontal when a predeter-

Fig.9A Fig.9B Fig.9C



BEST AVAILABLE COPY